

Remarks

Claims 1-7 are currently pending in the application.

Claim 1 stands objected to for certain recited informalities and rejected under 35 U.S.C. 102(b) as anticipated by U.S. Patent No. 4,716,123 to Wood and Swanson et al. (N.L. Swanson, D. B. Billard, "Multiple scattering efficiency and optical extinction", Phys. Rev. E, vol. 61, no. 4, April 2000, pp. 4518-4522).

Cancellation of claim 1 as requested herein above obviates the need for any discussion of these rejections as they regard claim 1.

Claims 2 and 4 stand rejected under 35 U.S.C. 103(a) as unpatentable over Swanson et al. The present invention discloses multiple practical applications for use in fields dealing with electromagnetic waves. The multiple applications allow the user to maximize scattering, minimize scattering, maximize absorption, minimize absorption, maximize backscattering (radar cross section), and minimize backscattering (radar cross section). These real world applications require some combination of the above control procedures. For example, stealth applications that require low radar cross section, or being undetectable to laser range finders, would require a combination of maximum scattering, maximum absorption and minimum backscattering. Providing markings to identify friend or foe would require a combination of minimum scattering, minimum absorption and maximum backscattering. Thus, it can be seen that scattering and backscattering are two

distinct variables that are controlled separately by the present method, which allows one variable to be maximized while another is minimized. The steps and formulas used for controlling general scattering of electromagnetic waves are found at pages 11-12 of the specification. The steps and formulas for controlling backscattering of electromagnetic waves can be found on pages 13-15 of the specification.

The Swanson article teaches a method for predicting the general scattering of electromagnetic waves in a medium with a dense concentration of particles. The Swanson article discloses that the Mie theory is accurate for calculating the general scattering of light in media that has a low density of particles, but fails to provide accurate scattering predictions for media with dense concentrations of particles. The Swanson article provides equations that may be used to predict general scattering of electromagnetic waves in media with dense concentrations of particles.

The Swanson article does not teach controlling an amount of scattering or absorption of electromagnetic (EM) waves. In the present Official Action, it is admitted on page 4 that Swanson does not teach minimizing the scattering of electromagnetic waves, wherein the combination with the smallest value will minimize the scattering of EM waves. The Action then states that it would have been obvious to have the method of Swanson et al. also minimize scattering wherein the combination with the smallest value will minimize the scattering of EM waves, for the purpose of optimizing particle size and material medium properties for applications that require minimum scattering of incident light. This allegation

being based solely upon the disclosure of maximizing scattering and absorption. Absent the teachings of the present application, not such conclusion can be reached and it is only with the teachings of the instant application before him/her that such a conclusion can be reached. As described at pages 12 and 13 of the specification, the procedure for determining the maximum scattering is considerably more complex than the claimed process for minimizing scattering. Thus the simplicity of the relationship to minimize scattering, although the general equations are defined in Swanson et al, does not and cannot suggest the claimed method for scattering minimization. Swanson et al, as well as the instant application both suggest procedures for scattering maximization that involve the construction of contour plots etc. which, in fact, are not necessary for determining scattering minimization as claimed in the instant application. Thus, to suggest that it would have been obvious to the skilled artisan to “simply reverse the scattering maximization” process disclosed by Swanson et al. and actually discussed in the instant application, is not correct since the claimed process is not the inverse of the scattering maximization process but rather defines a significantly less complex process that can only be determined through the application of the techniques described and claimed in the instant application. Finally, the mere knowledge of the light scattering extinction Q for a given particle would not enable or motivate one of ordinary skill in the art to derive parameters for producing a material that minimizes the backscattering of EM waves.

It is therefore respectfully submitted that rejection of claims 2 and 4 on the basis of the teachings of Swanson et al. is improper and should be withdrawn.

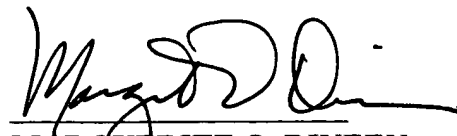
Claims 3 stand rejected under 35 U.S.C. 103(a) as unpatentable over Swanson et al. As an initial point, claim 3 being dependent upon claim 2 the arguments set forth hereinabove regarding the patentability of claim 2 are equally applicable vis-à-vis this rejection. Additionally, as stated hereinabove, scattering and backscattering are two distinct variables that are controlled separately by the present method which allows one value to be maximized or minimized independently of the other. The Swanson article does not teach maximizing or minimizing backscattering of EM waves. The Official Action states that it would have been obvious to minimize backscattering because the general scattering strength of a particle in a medium is given by the light scattering extinction Q described in the Swanson article. As just mentioned, scattering and backscattering are two very separate and distinct variables. The steps and formulas for controlling general scattering are different from the steps and formulas for controlling backscattering (see pages 11-12 and 13-15 of the specification). The light scattering extinction Q in the Swanson article merely defines the amount of energy that a particle will remove from the beam of light. Q does not define parameters for controlling scattering or backscattering of light and is not even used in equation 11 on page 14 of the specification that defines how to maximize backscattering. Thus, the mere knowledge of the light scattering extinction Q for a given particle would not enable or motivate one of ordinary skill in the art to derive parameters for

producing a material that minimizes the backscattering of EM waves. It is therefore respectfully submitted that rejection of claim 3 on the basis just described is improper and should be withdrawn.

Claims 5-7 stand rejected under 35 U.S.C. 103(a) as unpatentable over Swanson et al. The basis for this rejection is fundamentally the same as that presented in the rejection of claims 2-4 discussed hereinabove. Thus, the arguments refuting the validity of these rejections that are presented hereinabove can only be repeated here. Suffice it to say at this point, that these claims add to the materials previously discussed the minimization of absorption in combination with minimization of scattering and/or backscattering and that the arguments presented above in regard to these latter two variables are similarly applicable to the discussion of absorption as being raised by the instant rejection. It is therefore respectfully submitted that rejection of claims 5-7 for the reasons presented above is similarly improper and should be withdrawn.

In view of the foregoing amendment and the remarks presented hereinabove, it is respectfully submitted that claims 2-7 as now presented stand in condition for allowance and the same is most earnestly solicited at an early date.

Respectfully submitted,



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